

Remarks

Claims 331-376 are pending in this application.

Claims 331-349 and 360-367 were rejected under 35 U.S.C. 102(a,b) over Bowen et al. (USP 4,802,761), Krull (USP 5,449,918) or JP 2003565587. This rejection is respectfully traversed for the following reasons.

I. Applicants urge the Patent Office to note the referenced Claims are directed to transmitting electromagnetic radiation through the first structure on a substrate and transmitting electromagnetic radiation through the second structure on the substrate. It is the transmitted radiation that propagates through the sample as claimed in the referenced Claims.

The Bowen publication describes Raman scattering spectroscopy, which involves a completely different method of generating a reading. As explained by the National Institute of Standards [\(http://physics.nist.gov/Divisions/Div844/facilities/raman/Ramanhome.html\)](http://physics.nist.gov/Divisions/Div844/facilities/raman/Ramanhome.html) “[R]aman scattering is a powerful light scattering technique used to diagnose the internal structure of molecules and crystals. In a light scattering experiment, light of a known frequency and polarization is scattered from a sample. The scattered light is then analyzed for frequency and polarization. Raman scattered light is frequency-shifted with respect to the excitation frequency...” (emphasis added). To word it differently, Raman spectroscopy deals with inelastically scattered light, wherein the original incoming signal gets absorbed by a substance, after which a different scattered scattered is generated, the scattered signal being different from the incoming signal (in inelastic scattering incoming and scattered signals are not the same).

Specifically, in Col. 3, lines 48-51, Bowen explains that “[I]n resonance Raman spectroscopy, the wavelength of the exciting laser line is carefully chosen to coincide with a wavelength at which light is absorbed by a chemical compound” (emphasis added). In Col. 3, lines 16-19, Bowen says that “[I]n this method [Raman spectroscopy], the wavelength of the exciting laser line is carefully chosen to coincide with a wavelength

at which light is absorbed by a chemical compound” (emphasis added). In Bowen, contrary to the present invention as claimed, “the designs are based on the optical fiber bundle, and incorporate a 180 degree backscattering geometry” (emphasis added, Col. 9, lines 3-4); “The backscattered Raman radiation is then guided by the tube 42...” (emphasis added, Col. 9, lines 27-28)

Contrary to the essence of the Raman method described in Bowen, the present invention as claimed recites “transmitting electromagnetic radiation through a first substrate...”, “transmitting electromagnetic radiation through the second substrate....”(independent Claim 331), “transmitting electromagnetic radiation through a first structure...”, “transmitting electromagnetic radiation through the second structure....”(independent Claim 343). “a detector for detecting a spectral change in the electromagnetic radiation transmitted through the sensor..” (independent Claims 360 and 368).

Therefore, Bowen cannot be cited against the pending claims at the very least for the reason that it is a completely different spectroscopy method having nothing to do with detecting a first and a second measurements taken in the same electromagnetic radiation transmitted through the structure/substrate/sensor.

II. Applicants also urge the Patent Office to note that a Raman spectrum in general and, consequently, the Raman spectra described in the Bowen patent do not correlate, correspond in any way, and do not have any information about an intensity of surface plasmons that can be excited in a metal film. In other words, the intensity of a possible plasmon never factors into a reading or a measurement in the Raman spectroscopy before or after the binding of the analyte. There is no disclosure in Bowen whatsoever which mentions the intensity of a surface plasmon. There is no disclosure in Bowen that its method utilizes the first and the second transmitted radiation measurements as correlated

to the change in the intensity of the surface plasmon, contrary to what is claimed in independent Claim 331 and 343.

Moreover, there is no disclosure in the Bowen patent of “the spectral change in the transmitted electromagnetic radiation correlating with a change in a localized surface plasmon intensity” (independent Claim 360 and Claim 368). There is no disclosure in Bowen about the spectral change of the transmitted signal, and there is nothing in Bowen having to do with a change in the intensity of the plasmon and correlated to the change in transmitted signal before and after the binding of the analyte. That lack of disclosure logically follows from the fact that in general a Raman spectrum does not contain any information on the intensity of the plasmon and it does not correlate with the intensity of the plasmons.

The Patent Office wrote in the last Office Action that “Col. 5 of Bowen teaches that Laser and monochromator are tuned in the range of 220 nm – 900 nm to create a plasmon resonance phenomenon that is quantified by a detector.” The paragraph of Bowen referred to by the Patent Office reads as follows:

The preferred embodiment of the invention utilizes a pulsed laser that is tuneable from 220 nm to 900 nm. The detection system is based on an image intensified diode array detector, with gated electronics, which is coupled to a computer which records the data and controls the instrument.

The quoted disclosure has nothing to do with an intensity of a surface plasmon. The quoted disclosure has nothing to do with the change of intensity of the surface plasmon due to binding of the analyte. The quoted disclosure has nothing to do with obtaining two different signals of transmitted radiation and correlating those signals with a change of the intensity of the surface plasmon, as claimed in all independent pending Claims and their dependent Claims. Applicants assert that there is no description of such claim elements in the Bowen disclosure. It is respectfully requested that the Patent Office quotes specific column and line numbers in Bowen where it thinks those specific claim

elements are disclosed. Otherwise the referenced rejection under 35 USC 102 over Bowen should be withdrawn and the Claims should be moved to allowance.

In its Response to Arguments section the Patent Office wrote that “Bowen et al in Col. 8 lines 34-41 teaches one of the method of Raman spectroscopy include measurements of surface plasmon resonance of metalloid complexes.” Reproduced below are lines 34-41 of Col. 8 of Bowen:

**Another method involves the use of metal (silver and
35 others) colloids or sols, open or encapsulated within a
semipermeable glass membrane at the end of the optical
fiber probe. This device enhances the resultant Raman
signal with the SERS or SERRS effect. The SERRS
effect is accomplished by varying the laser wavelength,
40 as in RRS into the plasmon-resonance envelope of the
organic-metalloid complex.**

The undersigned attorney has read the quoted excerpt and cannot find anything in there that would even remotely relate to “measurements of surface plasmon resonance”. It is even unclear what exactly the Patent Office means. What kind of measurement? There is no mention of measuring anything in that excerpt. Again, this is logical, because the referenced excerpt is not about measurements at all. It is not about any measurement related to a surface plasmon resonance, and it is not about any measurement of a **change in the intensity of a surface plasmon** as correlated with two different signals of transmitted radiation.

What that excerpt says is that the light source wavelength is tuned to the surface plasmon band. Tuning to the plasmon spectral band has to do with the original light signal, which (in Raman spectroscopy) later gets absorbed by a compound, after which a **different scattered signal** (spectrum) is emitted and detected. Tuning the original light has nothing to do with any measurements related to a surface plasmon or the effect of the change in intensity of a surface plasmon on the transmitted electromagnetic signal, as claimed in all pending claims. Again, this is logical, since tuning an original light source to a certain band (in the Raman method) is not the same as the difference in two detected

transmitted signals as correlated to the change of intensity of the surface plasmon, as claimed in the pending Claims.

Therefore, the referred to arguments of the Patent Office are unsupported. Unless the Patent Office quotes specific column – line numbers of Bowen with the disclosure of the difference in two transmitted radiation signals as correlated with the change of the intensity of a surface plasmon resonance before and after binding of the analyte, the pending rejection under 35 USC 102 should be withdrawn and the Claims should be moved to allowance.

Claims 368-376 were rejected under 35 U.S.C. 103(a) over Bowen et al. (US 4,802,761). This rejection is respectfully traversed for all the reasons and arguments articulated above.

It is believed that the present application is in condition for allowance. A Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is very strongly encouraged to contact the undersigned to discuss any remaining issues.

Respectfully submitted,

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